Notes on the identity of *Loepa katinka diversiocellata* Bryk, 1944 and description of a new species, with notes on preimaginal morphology and some taxonomic remarks on other species (Lepidoptera: Saturniidae)

Stefan Naumann[1], Wolfgang A. Nässig[2] and Swen Löffler

Dr. Stefan Naumann, Hochkirchstrasse 11, D-10829 Berlin, Germany; sn@saturniidae.com.

Dr. Wolfgang A. Nässig, Entomologie II, Forschungsinstitut und Museum Senckenberg, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany; wolfgang.naessig@senckenberg.de.

Swen Löffler, Hospitalgasse 7, D-09350 Lichtenstein, Germany; swen.loeffler@t-online.de.

Abstract: On the basis of some expeditions by two of the authors (S.N., S.L.) and study of other recent collecting results from remote areas in N.E. Myanmar (= N.E. Burma) during the last years, a more detailed study of Saturniidae species from the Kachin State in northeastern Myanmar is now possible. The present paper deals with a survey of the Saturniidae taxa described by Bryk (1944) from the Swedish R. Malaise expedition to Kambaiti, Burma. In a first part (1), the current taxonomic status of his taxa is presented in an annotated list, supplemented by additional saturniid species now known from the N.E. Kachin State. In further parts, two of Bryk's taxa are specifically dealt with here: 2) *L. diversiocellata* Bryk, 1944 is found to be a new synonym of *L. katinka* (Westwood, 1847), **syn. n.**, based on type studies. Thereby the species which was misidentified as *L. diversiocellata* in recent literature for nearly 20 years due to a misidentification of Bryk's type of *L. katinka diversiocellata* has no available name. This species, widely distributed on the southeastern Asian continent, is, therefore, described as *Loepa* ***diffundata*** **sp. n.** The type series of the new species is restricted to specimens from Laos only. Male holotype and female paratype (allotype) will be donated to the Museum für Naturkunde in Berlin. Larval morphology of the new species is illustrated in colour. 3) *Antheraea mezops* Bryk, 1944 turned out during type studies to be a junior synonym of *A. castanea* Jordan, 1910, **syn. n.** A male lectotype for *A. castanea* Jordan, 1910, in BMNH, London, is **designated**.

Bemerkungen zu *Loepa katinka diversiocellata* Bryk, 1944, mit Beschreibung einer neuen Art sowie weiteren Bemerkungen zu Präimaginalstadien und zur Taxonomie anderer Arten (Lepidoptera: Saturniidae)

Zusammenfassung: Auf der Grundlage einiger Expeditionen von zweien der Autoren (S.N., S.L.) und anderem aktuell erhaltenen Material aus abgelegenen Gegenden in NE-Myanmar (= NE-Burma) ist eine detailliertere Studie der Saturniidenarten des Kachin-Staats in NE-Myanmar möglich. Die vorliegende Arbeit gibt einen Überblick über die von Bryk (1944) aus dem Material der schwedischen Expedition von R. Malaise nach Kambaiti, Burma, beschriebenen Saturniidenarten. In einem ersten Teil (1) werden alle Bryk'schen Taxa in einer Liste kommentiert und durch weitere heute bekannte Arten aus dem Kachin-Staat ergänzt. In zwei weiteren Teilen werden zwei Bryk'sche Taxa speziell abgehandelt: 2) *L. diversiocellata* Bryk, 1944 ist auf der Basis von Typenvergleichen als ein neues Synonym von *L. katinka* (Westwood, 1847), **syn. n.**, erkannt worden. Dadurch hat die Art, die in der aktuellen Literatur der letzten fast 20 Jahre als *L. diversiocellata* fehlidentifiziert wurde, keinen gültigen Namen. Diese im Südosten des asiatischen Kontinents weitverbreitete und gut abgegrenzte Art wird hier als *Loepa* ***diffundata*** **sp. n.** neu beschrieben. Die Typenserie wird auf laotische Exemplare begrenzt. Männlicher Holotypus und weiblicher Paratypus (Allotypus) werden im Museum für Naturkunde in Berlin deponiert. Die Raupenstadien der neuen Art werden farbig abgebildet. 3) *Antheraea mezops* Bryk, 1944 stellte sich im Typenvergleich als ein neues Synonym von *A. castanea* Jordan, 1910, **syn. n.** heraus; ein männlicher Lectotypus für *A. castanea* Jordan, 1910, im BMNH, London, wird hiermit **festgelegt**.

Introduction

For a long time the access to remote parts of the Union of Myanmar (= Burma) was nearly impossible, and almost no material was available for studies aside those older specimens achieved during colonial times by British museum collectors and the famous results of an expedition by the Swedish René Malaise in 1934 which today are deposited mainly in the Swedish Museum of Natural History (formerly Naturhistoriska Riksmuseet), Stockholm; only a few specimens of the original material are found in MAKB and LNK (Nässig & Oberprieler 1994: 370).

During recent years Burma opened a little, and several specimens collected during expeditions to Kachin State, the northeastern parts of the country, were accumulated by the senior author. They resulted from collecting efforts by Viktor Sinjaev (Moscow), Yasuyuki Watanabe (Amagasaki-shi) and some local collectors, and the material redirected our interest to this hardly accessible area. In June 2006 a first expedition was carried out by S. Löffler, Michael Langer and S. Naumann to places near and north of Kambaiti, the type locality of several Saturniidae taxa described by Bryk (1944). At that time, a new connecting road between N.E. Myanmar and the Chinese province of Yunnan was under construction and the pass via Kambaiti inaccessible. The visit of the northeastern Kachin State just along the Chinese border turned out to be strenuous and dangerous because of very bad weather conditions, military activity and almost no functioning public transport and communication systems.

During the 2006 expedition, all Saturniidae taxa described by Bryk (1944) were found again at almost topotypical places, except *Sinobirma malaisei* (Bryk, 1944) which, however, was received already earlier in 1998 from an

[1] 15th contribution to the knowledge of the Saturniidae fauna of China (14th contribution: Yun, W., & Naumann, S. (2006): The preimaginal instars of *Actias chapae* (Mell, 1950) (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **27** (1/2): 17–21).

[2] 72nd contribution to the knowledge of the Saturniidae (71st contribution: Beck, J., & Nässig, W. A. (2008): Diversity and abundance patterns, and revised checklist, of saturniid moths from Borneo (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **28** (3/4): 155–164).

© Entomologischer Verein Apollo e. V., Frankfurt am Main

expedition by V. Sinjaev to the Putao area, and from local collectors in a small series from the Myanmar–China borderline a little north of Kambaiti collected in 2007.

Material and methods

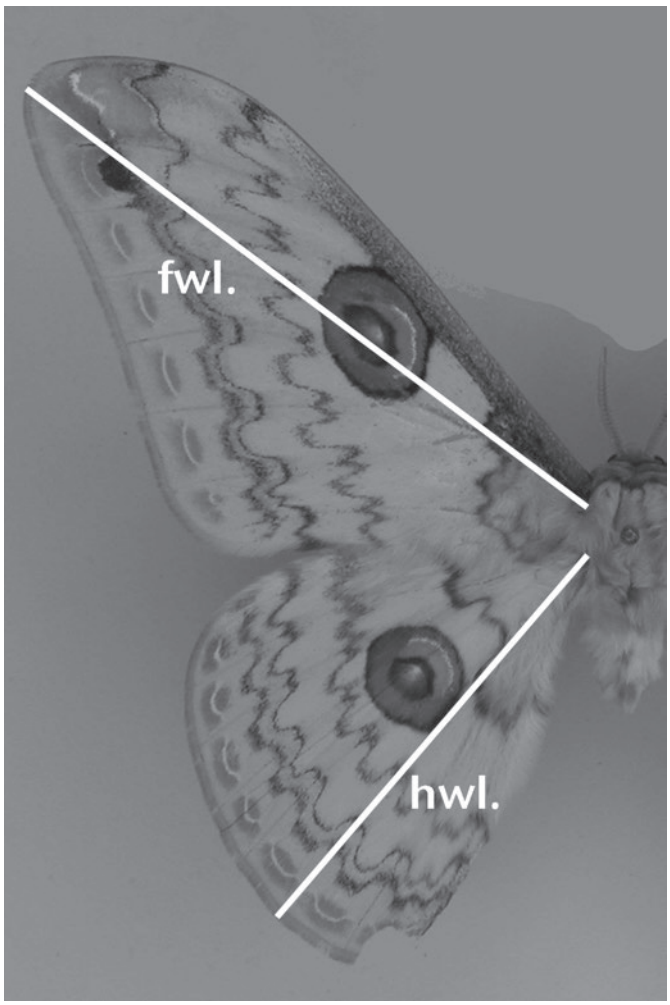
Material lists used for this study see below under the taxa dealt with. Morphological studies followed standard procedures.

Acronyms used

BMNH	The Natural History Museum, London, U.K. [formerly British Museum (Natural History)].
CAHS	Collection Armin Hauenstein, Schönenberg, Germany.
CBH	Collection Ulrich Brosch, Hille, Germany.
CSLL	Collection Swen Löffler, Lichtenstein, Germany.
CSNB	Collection Stefan Naumann, Berlin, Germany.
CTKI	Collection Teemu Klemetti, Imatra, Finland.
CWAN	Collection Wolfgang A. Nässig, now in SMFL.
EMEM	Collection Entomologisches Museum U. Eitschberger, Marktleuthen; now in part privately sold, in part in ZSM.
LNK	Staatliches Museum für Naturkunde Karlsruhe (formerly Landessammlungen für Naturkunde, Karlsruhe), Germany.
MAKB	Museum Alexander Koenig, Bonn, Germany.
MHNL	Muséum d'Histoire naturelle de Lyon, France.
MNHU	Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany.
NRMS	Swedish Museum of Natural History (formerly Naturhistoriska Riksmuseet), Stockholm, Sweden.
OUM	Oxford University Museum, Oxford, U.K.
SMFL	Senckenberg-Museum, Lepidoptera collection, Frankfurt am Main, Germany.
SMTD	Staatliches Museum für Tierkunde, Dresden, Germany.
ZMA	Zoölogisch Museum Amsterdam, Afdeling Entomologie, Amsterdam, The Netherlands.
ZSM	Zoologische Staatssammlungen, München (Munich), Germany.

Other abbreviations used

AT	"Allotype" (= a specifically marked paratype of the other sex as compared to the HT).
Fw.	Forewing.
Fwl.	Forewing length (measured in a straight line from the wing base to the most distant point of the apex; see Text-Fig. 1).
GP	Genitalia preparation (dissection no.).
HT	Holotype.
Hw.	Hindwing.
Hwl.	Hindwing length (measured in a straight line from the wing base to the point where vein Cu_1 reaches the outer wing margin, i.e., measured across the outer anal rim of the hw. ocellus; see Text-Fig. 1).
LT	Lectotype.
PLT[s]	Paralectotype[s].
PT[s]	Paratype[s].
ST[s]	Syntype[s].



Text-Fig. 1: Measurement methods (distances) for forewing length (fwl.) and hindwing length (hwl.) used in the text.

1) Results — Saturniidae of the N.E. Kachin State: an updated review

Most taxa were described by Bryk (1944) at subspecific or even infrasubspecific rank. The present access to small series of new material is very helpful for taxonomic work, because several of the taxa involved were later raised to species rank by other authors, in part obviously without checking the identity of the original material and the potential synonymies. Now the new material much easier allows a proper interpretation of the taxa.

The following list of species follows the names described or listed by Bryk (1944). The taxa are here cited in the original combination of Bryk, and the actual status is mentioned in square brackets []:

- *Actias selene malaisei* Bryk, 1944 [no changes since 1944].
- *Cricula andrei jordani* Bryk, 1944 [*Cricula jordani:* Nässig (1989a: 182)].
- *Solus parvifenestrata* Bryk, 1944 [*Solus parvifenestratus* (emendation): Nässig (1989b: 340)].
- *Antheraea assamensis mezops* Bryk, 1944 [*Antheraea (Antheraeopsis) mezops:* U. Paukstadt et al. (1999: 450); but see below].
- *Loepa katinka diversiocellata* Bryk, 1944 [*Loepa diver-*

© Entomologischer Verein Apollo e. V., Frankfurt am Main

siocellata: Pinratana & Lampe (1990: 22), but see below].
- *Salassa lola katschinica* Bryk, 1944 [*Salassa katschinika* [sic, misspelling]: Witt & Pugaev (2007: 1)].
- *Salassa mesosa excellens* Bryk, 1944 [no changes since 1944; Brechlin (1997: 79) cites the taxon with unclear status: "(*mesosa* ssp.?) *excellens*"].
- *Salassa mesosa* f. *melanops* Bryk, 1944 [infrasubspecific; no changes since 1944].
- *Opodiphthera (Sinobirma) malaisei* Bryk, 1944 [this species is not even distantly related to the genus *Opodiphthera* Wallengren, 1858; the subgenus was raised to a separate genus: *Sinobirma malaisei,* and transferred into the otherwise African tribe Pseudapheliini, now Urotini (see Oberprieler 1997): Nässig & Oberprieler (1994: 369)].
- *Rinaca zuleika malaisei* Bryk, 1944 [*Saturnia (Rinaca) zuleika:* Nässig (1995: 257), with synonym *malaisei*].
- *Caligula anna diversa* Bryk, 1944 [no changes since 1944; *diversa* was not specifically mentioned in Nässig (1995), but the genus *Caligula* Moore, 1862 (type species *Saturnia simla* Westwood, 1847) is listed there as a junior subjective synonym of *Rinaca* Walker, 1855 (type species *Saturnia zuleika* Hope, 1843) and was as such integrated as a subgenus into *Saturnia* von Paula Schrank, 1802; further revisional notes are in preparation].
- *Samia canningi* (Hutton, 1859), as mentioned by Bryk (1944: 3), turned out to be a mixed series; 1 of Bryk's 3 specimens was in fact *S. kohlli* Naumann & Peigler, 2001, only the other 2 specimens were true *S. canningi* (Peigler & Naumann 2003: 112 & 131, 133).

In addition to the taxa listed above and already mentioned by Bryk (1944), the following further Saturniidae species can be recorded from N.E. Kachin State so far:
- *Attacus atlas* (Linnaeus, 1758). This species was collected in the environments of Putao at an altitude of 800 m which probably is near the upper limits of its altitudinal range in N.E. Burma. In several other states of Myanmar it was recorded at lower elevations only.
- *Archaeoattacus edwardsii* (White, 1859). While *A. atlas* is recorded from lower altitudes only, *Arch. edwardsii* is more a representative of medium to high altitudes. It was recorded in Kachin State at altitudes from 800–1250 m, which is probably near the lower limits of its altitudinal range, judging from other records in Myanmar and outside that country.
- *Actias dubernardi* (Oberthür, 1897). This first record for Myanmar of this species described from China see in Naumann (2006: 9).
- *Actias winbrechlini* Brechlin, 2007. Specimens of this species were collected in May 2006 by Löffler, Langer & Naumann at 3000 m altitude near the Chinese borderline, and there are further specimens in the senior author's collection collected between 2660 and 2800 m from the Chudu Razi range situated a little further north. Regrettably this material was not considered as type material or listed otherwise by Brechlin although it was known to him at the time of description (2007: 17, 19).
- *Actias sinensis* Walker, 1855. Specimens are somehow larger in comparison to material from mainland China, but genitalia structures showed no significant differences.
- *Antheraea (Antheraea) frithi frithi* Moore, 1859.
- *Antheraea (Antheraea) roylii roylii* Moore, 1859.
- *Antheraea (Antheraea) helferi helferi* Moore, 1859.
- *Antheraea (Antheraeopsis) assamensis* (Helfer, 1837). While "*A. assamensis mezops*" as mentioned above is a typical representative of higher altitudes (compare also U. Paukstadt et al. 1998: 452, and see below), the true *A. assamensis* is a lowland species, collected at altitudes from 235 to 800 m in N.E. Myanmar.
- *Cricula zubsiana* Nässig, 1985. Records from N.E. Myanmar and Tibet in the senior author's collection widen the known range of the species further to the West. Previously it was known only from Yunnan province in China.
- *Loepa miranda* Atkinson *in* Moore, 1865. A fullgrown larva was found in N.E. Kachin State of Burma by the senior author; it showed no differences to those known from N. Thailand (photos seen by the senior author) or those figured by Nässig & Ragus (2001) from North India.
- *Lemaireia luteopeplus* Nässig & Holloway, 1988. An association of the material to one of the described subspecies cannot presently be made with certainty. Further material recently received from different provinces of Burma, Laos, and China may allow a new arrangement of the taxa involved in future.
- *Saturnia bieti* Oberthür, 1886.
- *Saturnia centralis* Naumann & Löffler, 2005.
- *Saturnia cachara* (Moore, 1872).
- *Saturnia simla* Westwood, 1847.
- *Salassa megastica* Swinhoe, 1894. This species can be determined easily by its generally large size, the relatively large greenish-transparent spot of the forewing and the large hindwing eyespots in vivid orange followed by greyish white (compare also the notes in the original description).

Taxonomic notes on some other of Bryk's taxa will follow in future papers from time to time, but two taxa are dealt with here in more detail: *Loepa katinka diversiocellata* and *Antheraea assamensis mezops*.

A publication (Racheli 2008) received just before print of the present work deals with a similar subject, listing recent new information on saturniid species from northern Myanmar; however, Racheli's paper contains fewer species, some errors, and we do not agree with his conclusions regarding *Loepa diversiocellata*, which, with respect to its genitalia morphology, apparently does not belong to the *sikkima*-group as he states. This publication came so late in our hands that we were not able to deal with it in more detail.

© Entomologischer Verein Apollo e. V., Frankfurt am Main

2) The taxonomy of *Loepa katinka diversiocellata*

Without having assessed the identity of Bryk's type material of *Loepa katinka diversiocellata,* this taxon was raised to species level by Pinratana & Lampe (1990: 22). If they had compared the types of Bryk's taxon with their Thailand material of *Loepa,* they would probably have noticed that *L. diversiocellata* sensu Pinratana & Lampe is different from Bryk's material, and Bryk was correct when he classified his taxon as a subspecies of *L. katinka* (Westwood, 1847).

The idea to use *diversiocellata* as the name for this large Thai species in Pinratana & Lampe (1990) was in part based on discussions about its identity between R. E. J. Lampe, J. D. Holloway, W. A. Nässig and others in the late 1980ies (see, e.g., Nässig & Treadaway 1988: 171), but the "Moths of Thailand" volume 1 was published before anyone looked at Bryk's original types and before there was a final mutual decision on this subject. And after this interpretation of the name was published, all specialists were content with the published version for the time being and used it in other publications (e.g., Nässig et al. 1996a).

Bryk's holotype data for *Loepa katinka diversiocellata* are: N.E. Burma, Kambaiti, 2000 m, 12.–17. vi. [19]34, Malaise; RM prep 7174 [yellowish cardboard]. The holotype specimen (♂) plus its genitalia are figured here in colour for comparision (Figs. 4a, 4b, 21).

L. katinka was described by Westwood (1847) after an indetermined number of specimens (= syntypes) from Assam and Sylhet (from the number of collections cited by Westwood there must have been at least 3 syntype specimens, possibly more), and Swinhoe (1892: 247) designated a ♂ from Assam out of that series as lectotype (see Nässig 2007). At least 2 of Westwood's specimens are still preserved in the collections of the Oxford University Museum, and the ♂ lectotype which comes very close to Westwood's figure is shown on a photo here for the first time (Figs. 3a, 3b). It has the following labels: "type Lep. No. 1984 *Saturnia katinka* Westwood, Hope Dept. Oxford — A. Westwood's type of *Saturnia katinka*, Cab. pl. 12 — *Saturnia Katinka* Westw., Cab. Orient. Ent. 87 [handwritten, Westwood] — Assam [handwritten] — Hope Ent. Coll. Oxf. Univ. Mus. genitalia no. 1987: 1376 — 1155". It has a fwl. of 46 mm. The second preserved specimen in OUM is a ♂ paralectotype which has the following labels: "B — 1155 — Ashmol. Mus." [= Ashmolean Museum; quite illegible, blue]. It also has a fwl. of 46 mm.

As mentioned by Nässig (2007: 176), Kirby (1892: 935) validly designated *L. katinka* as type species of the genus *Loepa* Moore, 1859 by indicating this species with an asterisk as explained in his foreword (Kirby 1892: vi). The publication containing the first description of *Loepa* was not the one by Horsfield & Moore (1860 ["1858–1859"]) as mentioned by Fletcher & Nye (1982: 92), but the work by Moore (1859) which was published earlier due to delays in publication of the Horsfield & Moore monography. This work of 1859 did not contain a valid designation of a type species and, because there were more than one species included, there was no type species by monotypy either, and therefore Kirby's designation is valid and necessary. A review of the taxonomy was published by Nässig (2007).

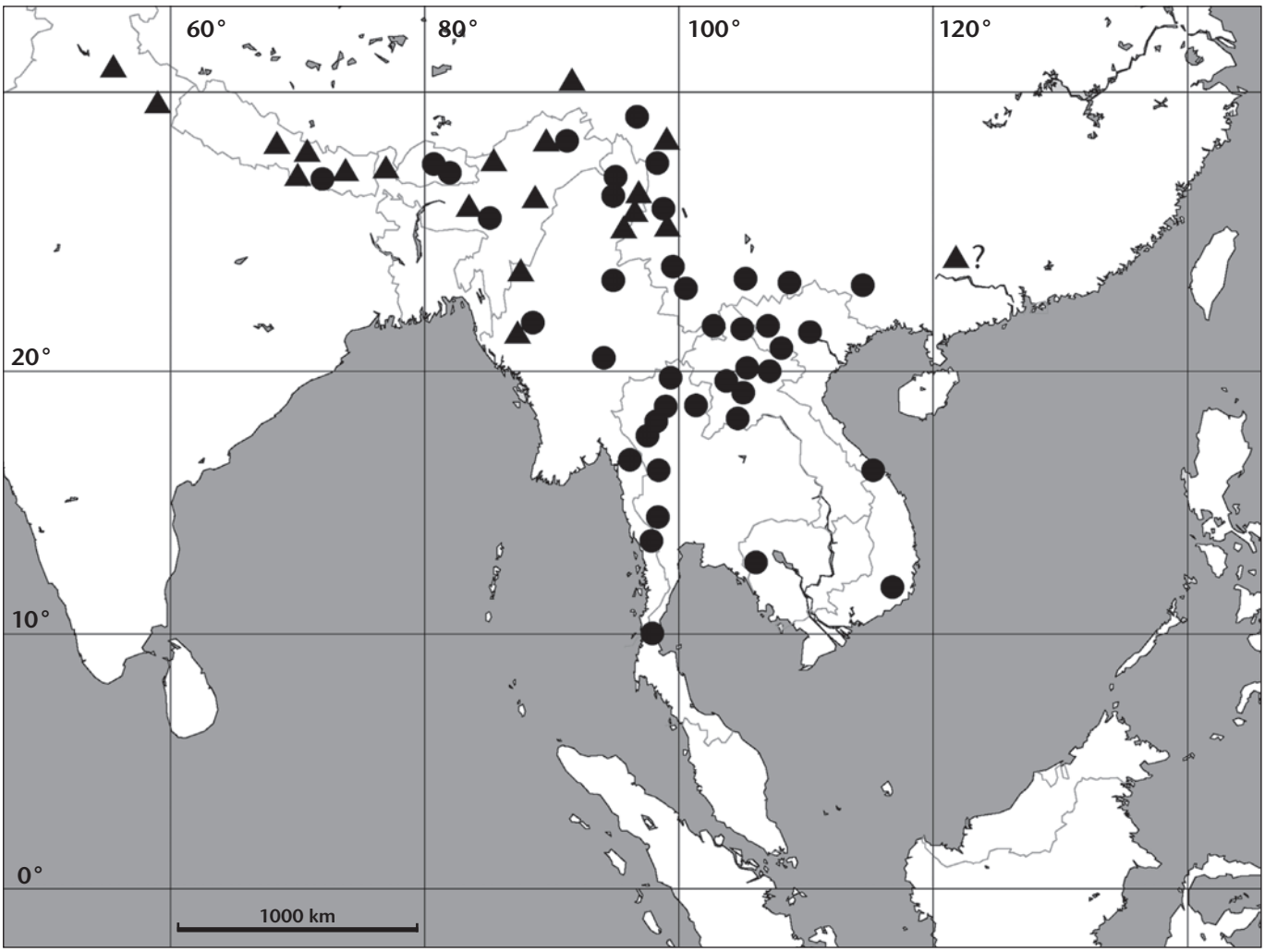
Roepke (1953) provided a review of the names in the genus *Loepa* published at that time. He was not sure about the correct classification of *L. katinka diversiocellata* and proposed that it could be related to *L. megacore* Jordan, 1911 (an opinion which had some impact on the discussion about the identity of the taxon *diversiocellata* in the 1980ies). As shown by Nässig & Suhardjono (1989: 209) all taxa cited in Roepke's paper as "*katinka*" from the Greater Sunda Islands were misidentified by him and are either *L. megacore*, *L. sikkima javanica* Mell, 1950, *L. cynopis* Nässig & Suhardjono, 1989, or *L. sumatrana* Nässig, Lampe & Kager, 1989. The larval instars described earlier by Roepke (1918) from Java and referred by him to *L. katinka* most likely belong to *L. sikkima javanica*. The larvae of the different species are generally quite similar and often do not allow an easy and safe identification from pictures, especially without sufficient reference material (photos) to compare with.

It can be seen from the locality data (see list below) that *L. katinka* is a solely Himalayan species which ranges from Western India via Nepal, Tibet and Myanmar to the western parts of the Chinese province of Yunnan; a specimen with genitalia like true *katinka,* but slightly different external habit is known from Guangdong Province and marked with a question mark in the map. Records from N.E. Pakistan are lacking so far, but the species might perhaps be expected to locally occur there as well. *L. katinka* is a medium-sized species which, as already noted by D'Abrera (1998: 46), is slightly larger on average, with a more triangular fw. shape than *L. sikkima* Moore, 1865 (which usually has a more rounded fw. shape) but has in general smaller ocelli on its wings in proportion to its size; in addition to this, the ♂ genitalia of *L. katinka* show no prominent separate process above the pollex (see below in the description for details) partly closing the otherwise wide U-shaped gap of *L. sikkima* and a different vesica with a more hump-like cornutus and a field or partial ring of small sclerites instead of a distinct single spine.

The following is a list of data of *Loepa katinka* specimens comprising material cited in recent literature (Allen 1993, Arora & Gupta 1979, Bryk 1944, D'Abrera 1998, Haruta 1992, 1994, Smith 2001) and from some museum and private collections (acronyms see list above); see Map 1.

Specimens from different places in India (Assam: Khasi Hills, Shillong; Arunachal Pradesh; Figs. 6, 9), Myanmar (Kachin State, topotype of *L. k. diversiocellata*, and Chin State; Figs. 5, 8) and China: Tibet (Fig. 7), the LT of *L. katinka* (Figs. 3a, 3b), the HT of *L. katinka diversiocellata* (Figs. 4a, 4b) and ♂ genitalia of specimens from Western India (Fig. 22) and of the HT of *L. katinka diver-*

© Entomologischer Verein Apollo e. V., Frankfurt am Main



Map 1: Distribution range of *L. katinka* (▲) and *L. diffundata* sp. n. (●) based on the specimens studied and the literature references cited. One symbol may include more than one locality closely together. The easternmost locality (from Guangdong Province in China) corresponds to a specimen which appears to be *L. katinka* from the ♂ genitalia, but needs further study (= question mark). — Map from Online Map Creation Dr. Martin Weinelt, www.aquarius.ifm-geomar.de, modified and supplemented.

siocellata (Fig. 21) are figured here. While specimens of *L. katinka* captured in the wild always show very intensively coloured and pointed black lines, often somewhat blurred, and sometimes really large ocelli, all reared specimens (which are mostly available from the northern Indian subcontinent) show a more bright yellow colour with less intensive markings, no blurring, and on average smaller ocelli.

Records of *Loepa katinka,* specimens used for comparison

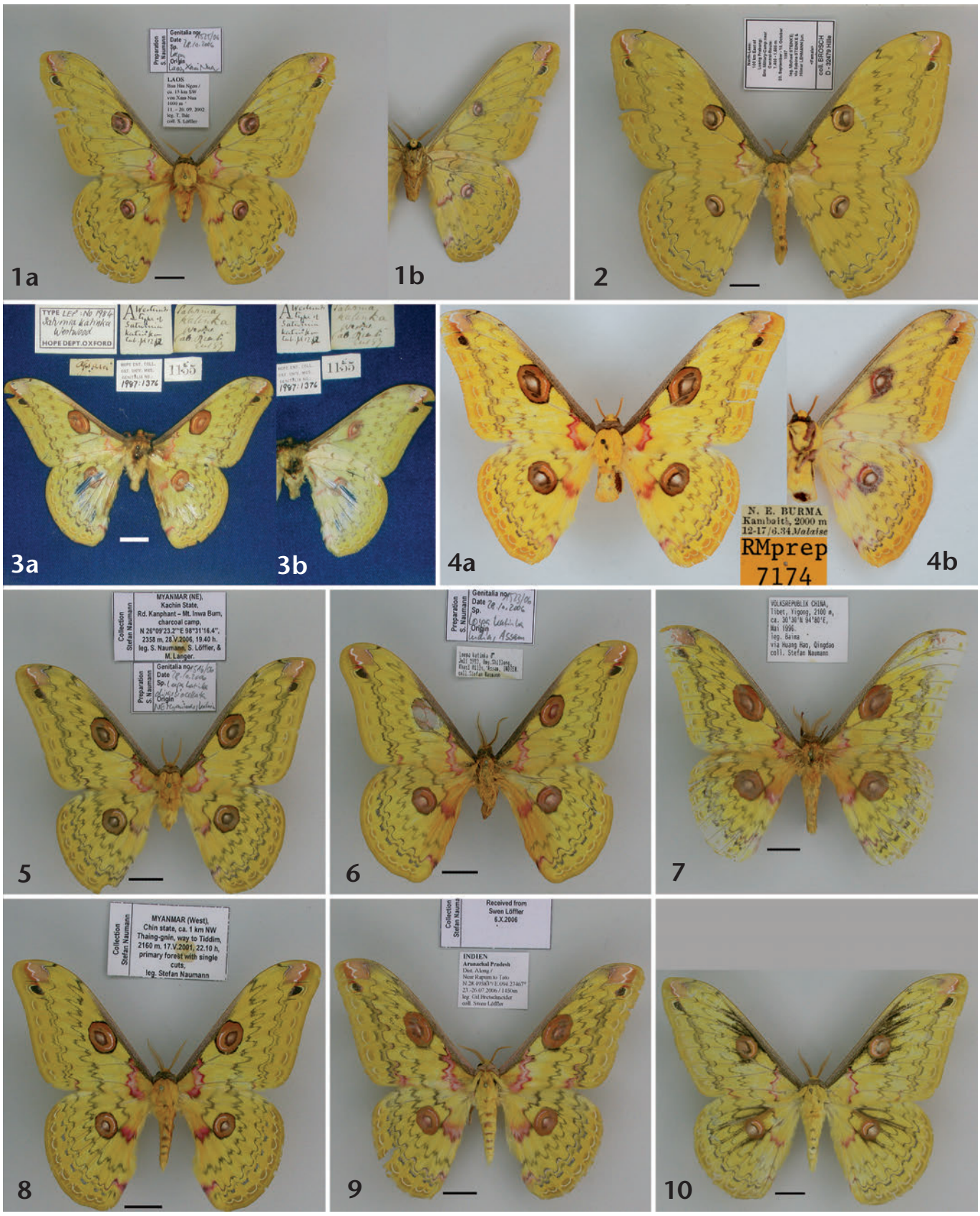
India: "Assam": 1 ♀, [Nagaland], Kohima, e.p. 11. v. 1981, CSNB; 2 ♂♂, 2 ♀♀, Khasi Hills, Shillong env., vii. 1993, ♂ GP 1593/06 Naumann, CSNB; 1 ♀, same locality, v. 1994, CSNB. — Meghalaya: 3 ♀♀, Khasi Hills, Shillong-Mawphlang, 600–1000 m, vii.–viii. 1997, leg. local collector, CSNB; 1 ♂, Shillong, Risa Colony, 13. iv. 1973, leg. M. Deb (Arora & Gupta 1979: 38). — Sikkim: 1 ♂, Pemayangtse, 2000 m, 23.–28. vii. 1990, leg. W. Thomas, CSNB; 1 ♂, Legship, 500 m, 24.–28. vii. 1990, leg. W. Thomas, CSNB; 13 ♂♂, 1 ♀, Sikkim (different localities), leg. W. Thomas, CWAN; 3 ♂♂, Mt. Kanchenjunga SE, 27°30′ N, 88°20′ E, 2000 m, 22.–31. vii. 1995, leg. Afonin & Siniaev, c/o A. Schintlmeister, CWAN; 1 ♂, (N), Toong, 1394 m, 30. vii. 1959, leg. A. G. K. Menon (Arora & Gupta 1979: 38). — West Bengal: 48 ♂♂, 1 ♀, env. Darjeeling, (Mangpu Road, Tiger Hill, other localities), ca. 1600–2400 m, M. v., M. vi.–M. viii. 1985–1990, leg. W. Thomas, CWAN (6 ♂♂ dissected). — Arunachal Pradesh: 1 ♂, Along Dist., near Rapum to Tato, 28°49′58.3″ N, 94°27′46.7″ E [sic], 1450 m, 23.–26. vii. 2006, leg. G. Bretschneider, CSNB; 4 ♂♂, Dist. Along, near Rapum to Tato, 28.49583° N, 94.27467° E [sic], 23.–26. vii. 2006, 1450 m, leg. G. Bretschneider, CSLL; 15 ♂♂, Lohit Dist., Roeing, 300 m, 5.–8. iii. 1969, leg. S. K. Tandon (Arora & Gupta 1979: 38). — Kumaon: 1 ♂, Nainital, Bhimtal, 1600 m, 13. vii. 1983, leg. F. Smetacek, GP 1450/06 Naumann, CAHS. — Further: Simla, Darjeeling, "Assam" (Cotes & Swinhoe 1887: 227); many reared specimens from different localities in northern India (CWAN [several ♂ & ♀ GPs], CSNB).

Nepal: 3 ♂♂, Mount Everest District, 2900 m, 25. viii.–20. ix. 1999, leg. V. Gurko, CSNB; 5 ♂♂, Dolakha prov., Jiri, 2200 m, 8.–14. vi. 1994, leg. H. Schnitzler, CSNB; 1 ♂, Central Nepal, Kathmandu Valley, Phulchoki, 2275 m, 11. vi. 1991, leg. Haruta, CSNB; 7 ♂♂, 1 ♀, Mt. Phulchoki, 15.–17. vi. 1990, 6.–16. vi. 1991 (Haruta 1992: 94); 1 ♂, Kakani, 2070 m, 16. viii.–31. viii. 1993, leg. D. E. Mannering, GP 750/95 Nässig, ZMA; 6 ♂♂, 1 ♀, Godavari, 20.–26. vi. 1990 (Haruta 1992: 94); 3 ♂♂, Godavari, 1700 m, 17. vi. 1990 (GP 666/91 Nässig), 15. vi., 18. vi. 1991, leg. M. Allen, c/o J.-M. Cadiou in CWAN.

Bhutan: several reared specimens from trader's import, CWAN.

Myanmar: Kachin State: 1 ♂, 1 ♀ (HT ♂ & AT ♀ of *L. katinka diversiocellata*), Kambaiti, 2000 m, 17. & 24. vi. 1934, ♂ GP RM7174, NRMS; 1 ♂, Imaw Bum Mts. [Inwa Bum], 2660 m, 31. v.–3. vi. 2002, leg. Y. Watanabe, CSNB; 1 ♂, Rd. Kanphant–Mt. Inwa Bum, charcoal camp, 26°9′23.2″ N, 98°31′16.4″ E, 2358 m, 28. v. 2006, 19.40 h, leg. S. Naumann, S. Löffler, & M. Langer, GP 1516/06

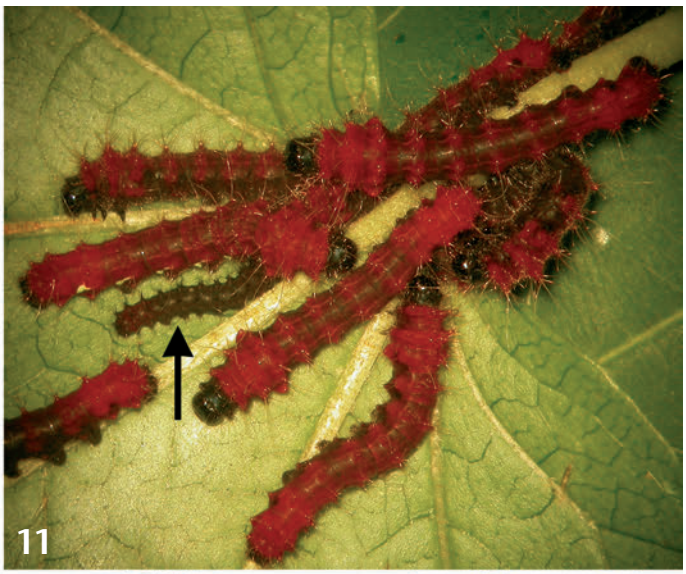
© Entomologischer Verein Apollo e. V., Frankfurt am Main



Colour Plate 1, Figs. 1–10: *Loepa* specimens. **Fig. 1:** *Loepa diffundata* sp. n., ♂ HT (CSNB > MNHU); **Fig. 1a:** dorsal view; **Fig. 1b:** ventral view. **Fig. 2:** *L. diffundata* sp. n., ♀ PT (AT) (CSNB > MNHU), dorsal view. **Fig. 3:** *L. katinka katinka*, ♂ LT (OUM); **Fig. 3a:** dorsal view; **Fig. 3b:** ventral view. **Fig. 4:** *L. katinka diversiocellata,* ♂ HT (NRMS); **Fig. 4a:** dorsal view; **Fig. 4b:** ventral view. **Fig. 5:** *L. katinka,* ♂ topotype of *L. katinka diversiocellata,* Kachin State, Myanmar (CSNB). **Fig. 6:** *L. katinka* ♂, almost topotype of *L. katinka katinka,* India, Assam, Khasi Hills, Shillong (CSNB). **Fig. 7:** *L. katinka* ♂, Tibet, Yigong, 2100 m (CSNB). **Fig. 8:** *L. katinka* ♂, Myanmar, Chin State (CSNB). **Fig. 9:** *L. katinka* ♂, India, Arunachal Pradesh (CSNB). **Fig. 10:** *L. diffundata* ♂, aberrant melanistic specimen, Bhutan, Mongar Dzongkhag (CSNB). — Specimens not to the same scale; scale bars 1 cm. — Photos S.N., except Fig. 4 (B. Gustafsson, NRMS).

Colour plate 2, Figs. 11–16: larvae of *Loepa diffundata* sp. n.; **Figs. 11–15:** Bhutan, **Fig. 16:** N. Thailand. **Fig. 11:** L_1 (arrow, partly covered by L_2 larvae) and L_2. **Fig. 12:** L_3 in moult to L_4. **Fig. 13:** L_4. **Fig. 14:** L_5. **Fig. 15:** L_5, details. **Fig. 16:** L_5. — Photos and rearing (on *Parthenocissus* sp., Vitaceae) S.N.

© Entomologischer Verein Apollo e. V., Frankfurt am Main



Naumann, CSNB; 1 ♂, Camp im Wald, Straße Mt. Emaw Bum–Kanphant, 2358 m, 26°9′23.2″ N, 98°31′ 16.4″ E, 28. v. 2006, leg. Langer, Naumann & Löffler, CSLL; 6 ♂♂, Chudu Razi Mts. Range, Kawnglangphu, 2800 m, vii. & viii. 2006, leg. loc. coll., via Y. Fukinuki, CSNB; 13 ♂♂, Chudu Razi Hills, 30 miles E Kawnglangphu, 7.–28. vi. 2007, leg. loc. coll., via A. Cotton, CSNB; 2 ♂♂, Chudu Razi Hills, 30 miles E Kawnglanghpu, 2. vii. 2006, 14. vi. 2007, leg. local coll., CSLL. — Chin State: 4 ♂♂, ca. 1 km NW Thaing-gnin, way to Tiddim, 2160 m, 17. v. 2001, 21.20–22.30 h, primary forest with single cuts, leg. S. Naumann, GP 1518/06 Naumann, CSNB; 2 ♂♂, same data, CWAN; 2 ♂♂, ca. 4 km NW Thaing-gnin, way to Tiddim, 2310 m, 20. v. 2001, 22.05 & 22.30 h, primary forest with single cuts, leg. Naumann, CSNB; 4 ♂♂, same locality, 25. v. 2001, 21.30–22.15 h, leg. Naumann, CSNB; 1 ♂, Kennedy Peak, summit near pagoda, 2690 m, 18. v. 2001, 20.30 h, open grassland with *Rhododendron* & *Quercus,* leg. S. Naumann, CSNB; 4 ♂♂, Natma

© Entomologischer Verein Apollo e. V., Frankfurt am Main

Taung N.P., road Mindat–Matupi, 20 miles camp, 21°25′ 15.2″ N, 93°47′21.5″ E, 2350 m, 27.–29. VI. 2008, 20.10–20.50 h, leg. Langer, Löffler & Naumann, CSNB.

PR China: Tibet: 1 ♂, Yigong, ca. 30°30′ N, 94°80′ E, 2100 m, v. 1996, leg. Baima, via Huang Hao, CSNB. – Yunnan: 1 ♂, (NW), Dali Bai autonom. Pref., Yunlong county, Fengshuining Mts., 2460 m, 13 km N Caojian, 25°46′ N, 99°6′ E, 10.–23. VI. 1999, leg. local collector, via R. Brechlin, CSNB; 6 ♂♂, (NW), Baimaxue Mt., Dexin env., 4500 m, VI. 1999, leg. Wang & Li, CSNB; 1 ♂, "*L. k. k.* [sic!] *septentrionalis* Mell" [handwritten, Mell], Li-kiang, 12. VII. 1934, leg. H. Höne, GP 907/03 Naumann, MAKB. – Guangdong: 1 ♂, (N), Yuyuan, Shikangkong Mt., 1800 m, IX. 2001, leg. Yin, CSNB.

No constant differences in the ♂ genitalia and in general external appearance of Himalayan *L. katinka katinka* from India (and other populations of *L. katinka*) on one side and *L. katinka diversiocellata* from Kachin State on the other side were found. Therefore, we herewith interprete *L. katinka diversiocellata* **syn. n.** as junior subjective synonym of its nominotypical subspecies *L. k. katinka,* thereby restricting *L. katinka* to a monotypical species again (for Mell's so-called Chinese subspecies of *L. katinka* compare Naumann 1998 and Yen et al. 2000).

Thereby it becomes clear that the species which was introduced into literature as "*L. diversiocellata*" by Pinratana & Lampe (1990: 22) and used by other authors in the same sense has no valid name now (there is no other younger synonym). Therefore this species is described herewith as new:

Loepa diffundata sp. n.

Holotype ♂ (Figs. 1a, 1b): Laos, Ban Hin Ngon, ca. 15 km SW Xam Nua, 1000 m, 11.–20. IX. 2002, leg. T. Ihle, via Swen Löffler, GP 1525/06 Naumann, ex CSNB, will be deposited in MNHU. – A red HT label will be fixed accordingly.

Paratypes (in total 82 ♂♂, 10 ♀♀), all from Laos:

1 ♀ (Fig. 2) (allotype), (N), 100 km E Luang Prabang, military camp env. near Central Route, 1400–1600 m, 20. IX.–10. X. 1997, leg. M. Steinke, via S. Steinke/H. Lehmann, via U. Brosch, ex CSNB, will be deposited in MNHU. A red AT label will be fixed accordingly. – 3 ♂♂, 100 km E Luang Prabang, military camp, 1400–1800 m, VII. 1997, leg. Lehmann, CSNB; 1 ♀, ca. 100 km E Luang Prabang, near military camp, 1400–1600 m, 20. VIII.–10. IX. 1997, leg. M. Steinke, via M. Beeke, CSNB; 8 ♂♂, 1 ♀, same data, CBH (1 ♂ GP CBH-080); 1 ♂, (N), 100 km E Luang Prabang, military camp env. near Central Route, 1400–1600 m, 20. IX.–10. X. 1997, leg. M. Steinke, via S. Steinke/H. Lehmann, via U. Brosch, CSNB; 2 ♂♂, same data, CBH; 3 ♂♂, ca. 100 km E Luang Prabang, near military camp, 1400–1600 m, 20. VIII.–10. IX. 1997, leg. M. Steinke, via S. Steinke & H. Lehmann, via U. Brosch, CWAN in SMFL; 2 ♂♂, ca. 100 km E Luang Prabang, 1400–1600 m, 20. VIII.–10. IX. 1997, leg. M. Steinke, via U. & L. H. Paukstadt, CWAN in SMFL [♂ GP 2005/07 Nässig]; 3 ♂♂, (C), Luang Prabang, > 1000 m, VII. 1997, leg. loc. coll., via F. Meister, CWAN; 1 ♂, Phu Soai Dao, 1680 m, 25. V. 1994, via S. Steinke, via CWAN in CSNB; 3 ♂♂, Vientiane province, Ban Viang Kham, 15 km S Phou Khoun, 950 m, end VI. 2003, mid VI. 2004 & mid–end IX. 2003, leg. T. Ihle, bought III. 2005 from S. Löffler, CSNB; 2 ♂♂, 1 ♀, Luang Prabang province, Louang Prabang env., VII. 1997, leg. Lehmann & Steinke, CSLL; 26 ♂♂, 1 ♀, Luang Prabang province, Phou Khoun, 1500 m: 4 ♂♂ end of VI. 2003, 1 ♂ early IX. 2004, 1 ♂ early X. 2004, 7 ♂♂ early IV. 2005, 2 ♂♂, 1 ♀ early V. 2005, 2 ♂♂ early VI. 2005, 3 ♂♂ early VII. 2005, 4 ♂♂ early VIII. 2005, 1 ♂ early IX. 2005, 1 ♂ early XII. 2005, leg. T. Ihle & local collectors, CSLL; 1 ♂, Luang Prabang province, Sala Pac Thu, 50 km N Phou Khoun, 25.–29. VIII. 2004, leg. T. Ihle, CSLL; 4 ♂♂, 4 ♀♀, Phongsaly province, Ban Aya village, 1.–5. IX. 2005, leg. T. Klemetti (CTKI); 3 ♂♂, Phongsaly Province, Phongsaly, Phou Fa, 21°41′34.4″ N, 102°6′50.3″ E, early XII. 2005, 1650 m, leg. T. Ihle & local collectors, CSLL; 6 ♂♂, Houa Phan Province, Ban Hin Ngon, ca. 15 km SW Xam Nua, 1000 m, 11.–20. IX. 2002, leg. T. Ihle, CSLL; 6 ♂♂, 1 ♀, Phongsali prov., Ban Aya village, 1200 m, 2.–6. IX. 2005, ex CTKI, received IX. 2007, L. Racheli coll., Rome; 2 ♂♂, Kamguht dist., Ban Nongkok, 400 m, 29. II., 5. III. 2008, via A. Cotton, L. Racheli coll., Rome; 6 ♂♂, Viang Chan Province, Ban Viang Kham, 950 m, 15 km S Phou Khoun, 4 of them end of III.–early IV. 2004, 2 of them mid V. 2004, leg. T. Ihle & local collectors, CSLL. – Blue PT labels will be fixed accordingly.

Derivatio nominis: The name *diffundata* is a form of the Latin verb DIFFUNDERE meaning "being [widely] distributed", and it is grammatically a ♀ adjectival form; however, the name is herewith defined to be a substantive in apposition. The new species is named after its wide distribution across a large portion of continental Indochina (see Map).

Further material of the new species examined or cited in literature, but not included into the type series which remains restricted to Laos:

Nepal: 1 ♂, Godavari 1550 m, VII. (Allen 1993: 61); 1 ♂, Godavari, 1550 m, 7. V. 1990, leg. M. Allen, CWAN (GP 667/91 Nässig).

India: "Assam": 1 ♂, Khasi Hills, V. 1994, GP 1527/06 Naumann, CSNB. – Arunachal Pradesh: 1 ♂, Dist. Along, near Rapum to Tato, 28.49583° N, 94.27467° E, 23.–26. VII. 2006, 1450 m, leg. G. Bretschneider, CSLL; 1 ♂, Dist. Along, Rapum, 9.–10. VII. 2007, 1800 m, 28.31995° N, 94.15325° E, leg. Bretschneider, CSLL. – Meghalaya: 1 ♂, Nokrek NP, Garo Hills, 25°40′ N, 91°4′ E, 1150 m, 2.–13. VII. 1997, leg. Afonin & Siniaev, c/o A. Schintlmeister, CWAN (GP 1361/00 Nässig). – West Bengal: 1 ♂, Darjeeling, Manjitar, 650 m, 5. IV. 1986, leg. W. Thomas, CWAN (GP 359/86 Nässig); 1 ♂, Darjeeling, 2100 m, 28. VIII.–1. IX. 1988, leg. W. Thomas, CWAN; 1 ♂, Darjeeling, Tiger Hill, 2400 m, 19. VI. 1990, leg. W. Thomas, CWAN. – Sikkim: 1 ♂, Pemayangtse, 2000 m, 20.–27. VIII. 1988, leg. W. Thomas, CWAN; 1 ♂, Mt. Kanchenjunga SE, 27°30′ N, 88°20′ E, 2000 m, 22.–31. VII. 1995, leg. Afonin & Siniaev, c/o A. Schintlmeister, CWAN.

Bhutan: 10 ♂♂, 1 ♀, Mongar Dzongkhag, forest road 6 km SW Limithang, 27°13′12″ N, 91°7′39″ E, 1600 m, 15./16. VI. 2007, ♂♂ 1.35.–3.50 h, ♀ 19.40 h, leg. P. Kautt & S. Naumann, CSNB; 1 ♂, same data, 15. VI. 2007, 1.40 h, leg. P. Kautt & S. Naumann, CSLL; 2 ♂♂, same data, 16. VI. 2007, leg. P. Kautt & S. Naumann, CSLL; 4 ♂♂, 3 ♀♀, same locality, e.o. 12.–24. VIII. 2007 & 15. XII. 2007, reared on *Parthenocissus* sp., CSNB; 8 ♂♂, 1 ♀, Mongar Dzongkhag, 5.5 km NNW Limithang, Yonkola, 27°18′31″ N, 91°9′48″ E, 1600 m, 19. VI. 2007, ♂♂ 1.40–2.45 h, ♀ 22.40 h, leg. P. Kautt & S. Naumann, CSNB; 3 ♂♂, same data, 19. VI. 2007, leg. P. Kautt & S. Naumann, CSLL.

Myanmar: Kachin State: 5 ♂♂, Zi Yar dam, 65 km NW Putao, 27°50′ N, 97°1′ E, 1250 m, 18.–21. V. 1998, leg. S. Murzin & V. Sinjaev, GP 1526/06 Naumann, CSNB; 1 ♂, Nan Thi, 50 km E Putao, 27°21′ N, 97°55′ E, 950 m, 11.–16. V. 1998, leg. Murzin & Sinjaev, CSNB; 1 ♂, Nan Sa Bon, 21 km E Putao, 27°21′ N, 97°37′ E, 550 m, 1.–5. V. 1998, leg. Murzin & Sinjaev, CSNB. – Shan State: 4 ♂♂, Balaishan, 2900 m, Xiadushuai, V. 2004, leg. Ying, CSLL; 4 ♂♂, Shoe Pin village, Utut Ni Pass, 20°57.142′ N, 96°37.635′ E, 1773 m, 4.–5. VIII. 2007, leg. P. Spona, T. Ihle, & S. Löffler, CSNB. 2 ♂♂, Yee Htut village, Utut Ni Pass, ca. 18 km W Pindaya, 1804 m, 20°56.935′ N, 96°36.390′ E, 2./3. VIII. 2007, leg. Spona, Ihle & Löffler, CSLL; 4 ♂♂, Shoe Pin (= Shopping) village, Utut Ni Pass, 1773 m, 20°57.142′ N, 96°37.635′ E, 4./5. VIII. 2007,

© Entomologischer Verein Apollo e. V., Frankfurt am Main

leg. Spona, Ihle & Löffler, CSLL. – Chin State: 1 ♂, Mt. Victoria (Nat Ma Toung) Nationalpark, Chin Hills, Mindat City, Kall Nue, 1457 m, 21°22.314′ N, 93°58.611′ E, 13. viii. 2007, leg. Spona, Ihle & Löffler, CSLL. – Tenasserim: 5 ♂♂, vii. 1996, CSNB; 1 ♂, Tenasserim City env., 600–800 m, 26. v. 1994, CSNB; 1 ♂, same data, 17.–24. viii. 1996, CWAN; 5 ♂♂, Dawna, x. 1990, CSNB; 1 ♂, Dawna (NE Moulmein), ca. 1300 m, 1.–8. ix. 1996, c/o S. Steinke, CWAN; 21 ♂♂, 1 ♀, Dawna Range, 6./30. iv. 1997, leg. Steinke & Lehmann, CSLL; 1 ♀, Dawna, vii. 1996, local people leg., via S. Steinke in EMEM, 23. ix. 1997 in CSLL; 1 ♂, Tenasserim, 28. vi. 1997, leg. Steinke & Lehmann, CSLL.

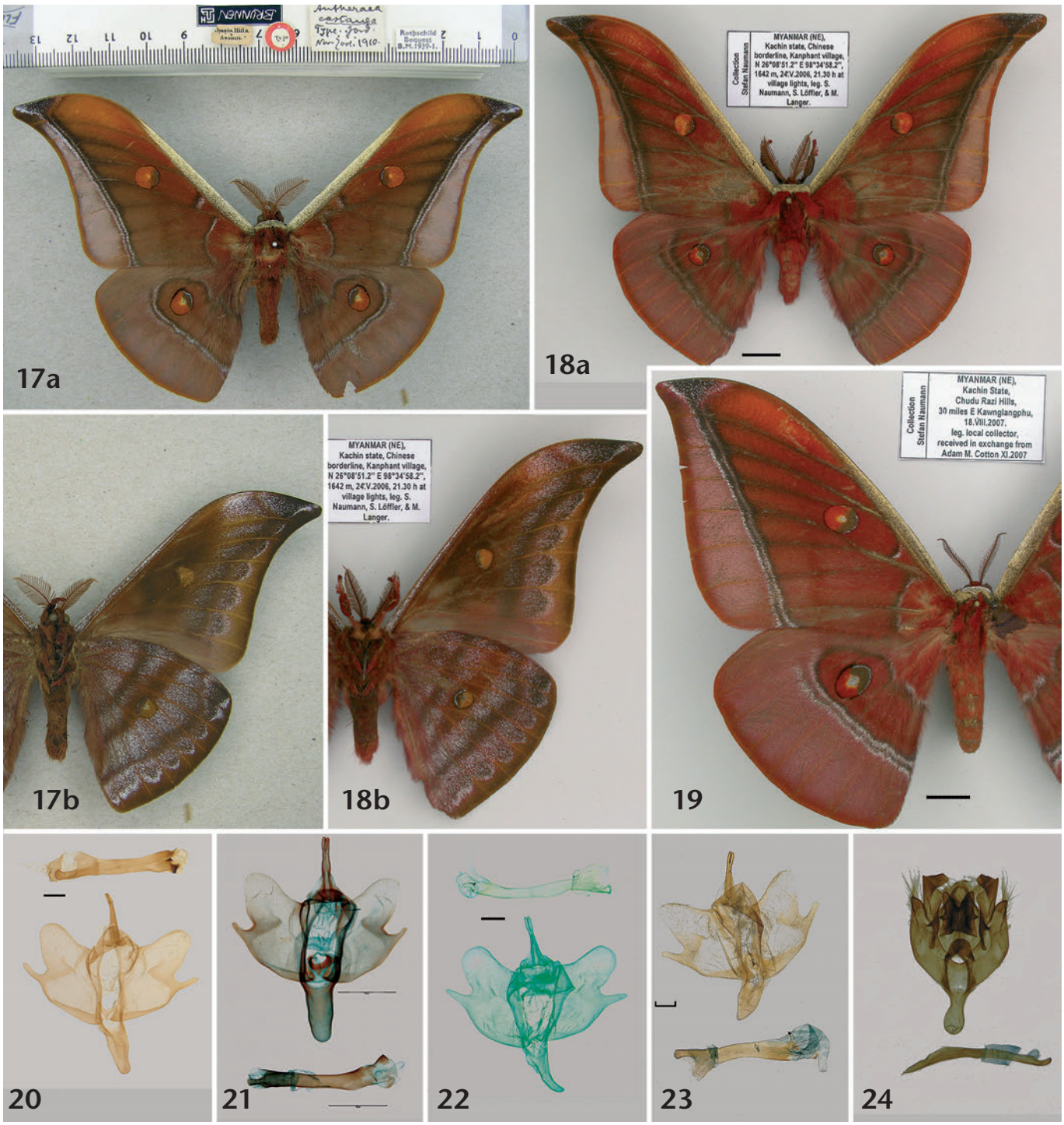
Thailand: Chiang Rai: 1 ♂, Huai Khom, 21. viii. 2001, leg. T. Ihle & loc. coll., CSLL. – Chiang Mai: 7 ♂♂, 8 ♀♀, (reared series e.o., no detailed locality data available), leg. A. Cotton, cult. 1988 W. A. Nässig, CWAN; 4 ♂♂, [no detailed locality], leg. S. Steinke, 10. iv. 1989, 3× 1. ix. 1996, CWAN; 2 ♂♂, Chang Wat, 6 km SE Pang Faen, 1100 m, 16. ix. 1999, leg. A. Szabo & Zita, CWAN; 2 ♀♀, Doi Pui, 24. & 31. v. 1987, leg. A. Cotton, CSNB; 1 ♂, same locality, 12. v. 1986, A. Cotton leg., via CSNB, SMFL; 1 ♂, Doi Suthep, 31. viii. 1989, leg. A. Cotton, CSNB; 1 ♂, Mae Taeng, 12. x. 1989, leg. A. Cotton, CSNB; 3 ♂♂, same locality, 14. viii., 7. x. & 17. xi. 1989, leg. S. Steinke, CWAN; 3 ♂♂, Doi Inthanon, 5. vi. & 5. ix. 1989, CSNB; 3 ♂♂, Doi Phahompok, 18 km NW Fang, 2100 m, 10.–11. ix. 1999, A. Szabo & Zita leg., CWAN; 5 ♂♂, 6 ♀♀, Mae Ai, Doi Pha Hom Pok, 2000 m, ex ovo in Berlin xii. 2006 on *Parthenocissus* sp., CSNB; 1 ♂, Doi Pha Hom Pok, Mae Ai, 2000 m, 20./26. x. 2003, leg. T. Ihle; 2 ♂♂, same data, 2050 m, 1./5. iv. 2005, leg. T. Ihle; 6 ♂♂, same data, 8./11. viii. 2005, leg. T. Ihle; 1 ♂, same data, 6./11. iii. 2006, leg. T. Ihle; 6 ♂♂, same data, 20./23. iv. 2006, leg. T. Ihle; 5 ♂♂, same data, 5./7. v. 2006, leg. T. Ihle; 3 ♂♂, same data, 21./25. viii. 2006, leg. T. Ihle; 1 ♂, same data, 2045 m, 16./17. vii. 2005, leg. M. Hoffmann & T. Ihle; 5 ♂♂, 1 ♀, Doi Suthep, ca. 30 km N Chiang Mai, 1400 m, A. viii. 2000, leg. T. Ihle & loc. coll.; 2 ♂♂, same data, x. 2000, leg. T. Ihle & loc. coll.; 3 ♂♂, same data, xii. 2000, leg. T. Ihle & loc. coll.; 1 ♂, 2 ♀♀, same data, E. ix. 2003, leg. T. Ihle & loc. coll.; 1 ♀, same data, 23./30. v. 2004, leg. T. Ihle & loc. coll.; 5 ♂♂, 5 ♀♀, same data, M. viii. 2004, leg. T. Ihle & loc. coll.; 3 ♂♂, Doi Angkhang, Fang, 1400 m, 25./27. iv. 2006, leg T. Ihle; 1 ♂, same data, 1619 m, 3./4. x. 2001, leg S. Löffler & T. Ihle; 1 ♂, between Chiang Dao & Kariang, 19°25′N, 98°48′ E, 900 m, 26. x. 2002, leg. B. Herczig & G. Ronkay, CAHS; 4 ♂♂, Doi Inthanon, Mae Cham Distr., 18°30′ N, 98°27′ E, 2000 m, 27. x. 2005, leg. A. Schintlmeister, GP 1398/06 Naumann, CSNB; 7 ♂♂, 1 ♀, Doi Inthanon NP, 1500 m, 28./30. iv. 2006, leg. T. Ihle; 4 ♂♂, same data, 29. vii./2. viii. 2006, leg. T. Ihle; 2 ♂♂, same data, 26./29. viii. 2006, leg. T. Ihle. – Nan: 1 ♂, Doi Phuka, Pua, km 37, 1450 m, 8. i. 1992, leg. H. Schnitzler, GP 679/93 Nässig, CSNB; 1 ♀, 1990, leg. I. Kitching (D'Abrera 1998: 48). – Tak: 3 ♂♂, Doi Mussoe, road Tak–Mae Sot, 800 m, 18.–23. iv. 2002, leg. T. Ihle, CSLL. – Kanchanaburi: 1 ♂, Kanchanaburi, Sai Yok, 196 m, 5./6. v. 2008, leg. T. Ihle, CSLL; 1 ♀, 3. x. 1988, CBAP; 3 ♂♂, 1 ♀, Si Sawat, 12. x. 1998, MHNL. – Ranong: 1 ♂, 15. v. 1992, CSNB; 1 ♂, Ranong env., iii.–iv. 1999, GP 1399/06 Naumann, CSNB; 1 ♂, Ranong vic., iii.–iv. 1999, via Steinke, via Beeke, GP 1617/07 Naumann, CWAN; 1 ♂, Isthmus of Kra, 500 m, Ranong, TV-Station, E. iii. 2003, leg. loc. coll. & T. Ihle, CSLL.

Vietnam, northern part: Mt. Fan-Si-Pan/Chapa [Sa Pa] environments (Lao Cai province): Western Slopes: 3 ♂♂, 22°20′ N, 103°40′ E, 1600–1800 m, secondary forest, ix. 1994, leg. Mong, via A. Schintlmeister, CSNB; 4 ♂♂, 22°20′ N, 103°40′ E, 1600–1800 m, Kulturland, iv. 1995, leg. V. Sinjaev & local coll., via A. Schintlmeister, GP 1529/06 Naumann, CSNB; 13 ♂♂, Westseite, bei Chapa, 22°20′ N, 103°40′ E, 1600–1800 m, Sekundärwald/Kulturland, iv. 1995, leg. V. Sinjaev & loc. coll., via A. Schintlmeister, CWAN; 24 ♂♂, Westseite, bei Chapa, 22°20′ N, 103°40′ E, 1600–1800 m, vi.–viii. 1995, leg. loc. coll., via A. Schintlmeister, CWAN; 5 ♂♂, Westseite, bei Chapa, 22°20′ N, 103°40′ E, 1600–1800 m, Sekundärwald, ix. 1994, leg. Mong, via A. Schintlmeister, CWAN; 3 ♂♂, bei Chapa, 22°20′ N, 103°40′ E, 1600–1800 m, Sekundärwald/Kulturland, 10. vi.–6. vii. 1995, leg. V. Sinjaev & loc. coll., via A. Schintlmeister, CWAN. Northern Slopes: 4 ♂♂, bei Chapa, 22°20′ N, 103°40′ E, 1600 m, Primärwald, 20.–30. iv. 1995, leg. V. Sinjaev & loc. coll., via A. Schintlmeister, CWAN; 1 ♂, bei Chapa, 22°17′ N, 103°44′ E, 1525 m, Primärwald, 28. x.–3. xi. 1994, leg. Sinjaev & loc. coll., via A. Schintlmeister, CWAN; 1 ♂, 22°17′ N, 103°44′ E, Primärurwald, 1600 m, 28. x.–3. xi. 1994, leg. V. Sinjaev & local coll., via A. Schintlmeister, CSNB; 1 ♂, 22°17′ N, 103°44′ E, Primärurwald, 1600 m, 20.–30. x. 1995, leg. V. Sinjaev & E. Afonin, via A. Schintlmeister, CSNB: Other: vic. Cha Pa, 22°15′ N, 103°46′ E, ca. 2400 m, 8.–29. v. 1993, leg. Sinjaev & Simonov, via A. Schintlmeister, CWAN; 2 ♂♂, 1 ♀, 2400 m, 8.–20. v. 1993, leg. V. Sinjaev & Simonov, CSNB; 1 ♂, Sa Pa City, 1425 m, 22°19.926′ N, 103°50.489′ E, 15./16. x. 2001, leg. & coll. CSLL; 5 ♂♂, (250 km from Hanoi 310°), SaPa, 1250 m, 10. vi./1. vii. 1998, A. Napolov leg., via EMEM 26. xi. 1998 in CSLL; 1 ♂, Tram Ton, SaPa, 2050 m, v. 2002, leg. H. B. Nguyen, CSLL; 2 ♂♂, 2400 m, 7./9. v. 2005, leg. H. B. Nguyen, CSLL; 4 ♂♂, same data, vii. 2006, leg. H. B. Nguyen, CSLL; 7 ♂♂, 1 ♀, Nui Se, 1930 m, viii./ix. 2001, leg. loc. coll., CSLL. – Tam Dao environments (Vinh Phuc province): 8 ♂♂, 21°27.399′ N, 105°38.972′ E, 950 m, 22./23. x. 2001, leg. & coll. CSLL; 1 ♂, same data, 13. xi. 2001, 4:00 h, leg. H. B. Nguyen, CSLL; 12 ♂♂, same data, iii. 2002, leg. H. B. Nguyen, CSLL; 1 ♂, 1 ♀, same data, iv. 2002, leg. H. B. Nguyen, CSLL; 1 ♀, same data, vii. 2003, leg. H. B. Nguyen, CSLL; 2 ♀♀, same data, 15./20. ix. 2003, leg. H. B. Nguyen, CSLL; 2 ♀♀, same data x. 2003, leg. H. B. Nguyen, CSLL; 3 ♂♂, (55 km NNW Hanoi), Tam Dao vill., 800 m, 21. vii./5. viii. 1998, A. Napolov leg., ex EMEM 26. xi. 1998 in CSLL; 1 ♂, 60 km NW Hanoi, 21°34′ N, 105°20′ E, 950 m, 17. x. 1994, leg. V. Sinjaev, via A. Schintlmeister, CSNB; 9 ♂♂, same data, iv. 1995, leg. Siniaev, via A. Schintlmeister, CWAN (GP 2004/07 Nässig); 1 ♀, ca. 1000 m, 24.–26. vi. 1999, leg. Kallies, Arita et al., CSNB. – Mai Chau: 2 ♂♂, 25 km SE Moc-Chau, 20°50′ N, 104°50′ E, 1400 m, 14.–18. xi. 1994, leg. V. Sinjaev & Simonov, via A. Schintlmeister, CSNB; 5 ♂♂, same data, CWAN; 5 ♂♂, 20°50′ N, 104°50′ E, 40 km SE Moc-Chau, 1400 m, 7.–15. iv. 1995, leg. V. Sinjaev & loc. coll., via A. Schintlmeister, CWAN. – 1 ♂, Kim Boi, 30 km W Hoa Binh, 20°50′ N, 105°15′ E, 200 m, 19. xi. 1994, leg. Sinjaev & Simonov, via A. Schintlmeister, CSNB; 1 ♂, same data, CWAN. – 1 ♂, Tuan-glao, 21°35′ N, 103°25′ E, 1200 m, 5.–10. xi. 1994, leg. Sinjaev & Simonov, via A. Schintlmeister, CWAN. – **Southern part:** Thua Thien province: 12 ♂♂, 2 ♀♀, Hue, county A Luoi, village A Rong, housing area Khe Cha Lenh, 809 m, Naturschutzgebiet, Regenwald, 16°5.374′ N, 107°27.559′ E, 12./13. viii. 2004, leg. S. Löffler, P. Spona & T. Frederking, CSLL. Thua Thien Hue province, Bach-Ma National Park: 21 ♂♂, 16°10′ N, 107°54′ E, 1200 m, 26. vii.–6. viii. 1996, leg. V. Siniaev & E. Afonin, via A. Schintlmeister, CWAN. – Lam Dong province: 1 ♂, county Di Linh, 24./26. iv. 2003, leg. H. B. Nguyen, CSLL; 8 ♂♂, county Lam Ha, village Bhu Son, Regenwald, 1320 m, 11°55.079′ N, 108°10.711′ E, 9./12. vi. 2005, leg. H. B. Nguyen, CSLL; 1 ♂, same data, 18.–19. vii. 2002, leg. S. Löffler & M. Hoffmann, CSLL; 1 ♂, same data, 10.–11. vii. 2002, leg. Löffler & Hoffmann, CSLL. – Kon Tum/Quang Nam provinces, Plato Tay Nguyen (Central Highlands), Mt. Ngoc Linh: 28 ♂♂, 3 ♀♀, 15°2′ N, 107°59′ E, 900–1400 m, 10.–25. viii. 1996, leg. V. Siniaev & E. Afonin, via A. Schintlmeister, CWAN (GP ♂ 1307/00 Nässig).

Cambodia: 1 ♂, Cardamom Mts., Tumpor area, submontane forest, 12°22′ N, 103°2′ E, 1250 m, 27. ii.–5. iii. 2000, leg. M. Nuss, SMTD; 1 ♂, same data, GP 1528/06 Naumann, CSNB.

PR China: Tibet: 1 ♂, Jiulong county, Shangri La, 3200 m, 6. vi. 2004, leg. G. Bretschneider, CSLL. – Yunnan: 10 ♂♂, 2 ♀♀, (N), Sanfengshan, 2897 m, Yaoan, vii. 2000, leg. Yin, CSLL; 6 ♂♂, 1 ♀, (NW), near East Tibet border, Daxueshan Mt., Deying, E. vi. 2002, leg. Ying, CSLL; 5 ♂♂, (SW), Daxueshan, Yongde, 3504 m, v. 2000, leg. Yin, CSLL; 1 ♂, (S), Hei Mt., 2300 m, Lanchang, viii. 1999, leg. Zhi, CSLL; 6 ♂♂, (SE), Maguan, Suiyuanquing, 2500 m, vii. 2000,

© Entomologischer Verein Apollo e. V., Frankfurt am Main


17a
18a
17b
18b
19
20
21
22
23
24
MYANMAR (NE), Kachin state, Chinese borderline, Kanphant village, N 26°08'51.2" E 98°34'58.2", 1642 m, 24.V.2006, 21.30 h at village lights, leg. S. Naumann, S. Löffler, & M. Langer.
Collection Stefan Naumann
MYANMAR (NE), Kachin State, Chudu Razi Hills, 30 miles E Kawnglangphu, 18.VIII.2007. leg. local collector, received in exchange from Adam M. Cotton XI.2007

Colour plate 3, Figs. 17–19: *Antheraea (Antheraeopsis)* specimens. **Fig. 17:** *A. castanea,* ♂ ST (BMNH, phot. V. Zolotuhin); **Fig. 17a:** dorsal view; **Fig. 17b:** ventral view. **Fig. 18:** *A. castanea* ♂, Myanmar, Kachin State, topotype of *A. mezops* (CSNB); **Fig. 18a:** dorsal view; **Fig. 18b:** ventral view. **Fig. 19:** *A. castanea* ♀, Myanmar, Kachin State (CSNB), dorsal view. — Specimens not to the same scale, scalebar 1 cm. — **Figs. 20–24:** ♂ genitalia. **Fig. 20:** *L. diffundata* HT, GP 1525/06 Naumann. **Fig. 21:** *L. katinka diversiocellata* HT, GP RM 7174 (scale bar not "50 µm" as indicated in error, but approx. 2 mm). **Fig. 22:** *L. katinka,* India, Bhimtal, GP 1450/06 Naumann. **Fig. 23:** *L. diffundata,* Myanmar, Kachin State, GP 1526/06 Naumann. **Fig. 24:** *A. castanea,* ♂ ST, GP BM-Sat. 706 (phot. V. Zolotuhin). — Figs. not to the same scale, scale bar 1 mm, except in Fig. 21. — All photos S.N., except where indicated otherwise.

leg. Li & Tu, CSNB; 4 ♂♂, (S), 30 km N Lanchang, Hei Mt., 2400 m, 20.–30. viii. 1999, leg. Wang & Li, CSNB; 4 ♂♂, (S), Wongding forest area, ca. 20 km W Changyuan, 2500 m, ix. 1999, leg. Wang & Li, CSNB; 1 ♂, (S), central-north Changyuan near border of Dima county, Guokandashan Mt., 2000–2300 m, ix. 1999, leg. Wang & Li, CSNB; 1 ♂, Yunlong county northern border, N Baoshan, Daorenshan Mt., 2800–3200 m, ix. 1999, leg. Wang & Li, CSNB; 1 ♂, Mengla, 21°27′ N, 101°34′ E, 900 m, 1.–23. iv. 2006, leg. local collector, via V. Sinjaev, CSNB; 2 ♂♂, (E), Honghe, Wulaofeng, 2500 m, vii. 2003, leg. Li et al., CSNB. — Guangxi: 3 ♂♂, (W), Laogongshan, Mt. Xiling, 1800 m, vi. 2002, leg. Li, CSLL.

Description

♂ (Figs. 1a, 1b, 10). In general, *L. diffundata* is a medium to large sized *Loepa* species. Ground colour bright yellow, antennae ochreous brown, 9.5–11.0 mm long, with around 29 segments, up to the last 3 segments quadripectinate, length of rami 1.4 mm at maximum. Labial palpi yellow, collar, prothorax and proximal half of costa greyish. Tibiae and tarsi pinkish grey, rest of thorax and abdomen in ground colour with a dorsal and lateral row

© Entomologischer Verein Apollo e. V., Frankfurt am Main

of grey patches. Fwl. 48–62 mm (HT 56 mm, average 55.5 mm, n = 111), hwl. 33–39 mm (HT 37 mm, average 36.0 mm, n = 84, largest specimens from Bhutan and India, smallest specimens from Vietnam and Yunnan. Typical markings of the fw. are the light pink median line which becomes darker to its outer margin and ends bordered with black at its costal part; the almost round or slightly oval fw. ocellus with 7.5–10.0 mm maximum diameter; the black median zigzag band and two bluish postmedian zigzag bands ending in the black and pink apical area; and a dark yellow row of patches with white halfmoon structures on the outer margin, all this on yellow ground colour. Hw. antemedian line is almost black, only the marginal 5–7 mm are of dark to lighter pink colour. Hw. ocellus more oval, of 6.0–7.5 mm maximum diameter. Rest of ornamentation similar to the fw., but the inner postmedian zigzag band ending broad pinkish-violet at the anal angle. The ventral side in inner parts a little lighter yellow, outside postmedian lines the same colour as on dorsal side. Ornamentation is similar, with few differences: The antemedian band of the fw. is only black, and both fw. and hw. ocellus are smaller, the outer dorsal portion less developed.

An aberrant, partly melanistic ♂ specimen was collected in eastern Bhutan by the senior author among a series of normally coloured specimens (Fig. 10). Other melanistic specimens are known in the genus *Loepa* only from some part of the Himalayan specimens of *L. sikkima* (a regularly appearing form only in some part of the Himalayan distribution range of *L. sikkima,* where it can sometimes reach more than 50% of the population, not found elsewhere), and regularly in all specimens of *L. obscuromarginata* Naumann, 1998 (a member of the distantly related *miranda*-species-group of the genus *Loepa,* see Yen et al. 2000).

♀ (Fig. 2). Similar to the ♂♂, but ♀♀ show typical sexual dimorphism, such as larger size (fwl. 56–75 mm, AT 75 mm, average 61.0 mm, n = 8; hwl. 36–45 mm, AT 45 mm, average 41.5 mm, n = 8), more rounded wing shape and details of antennae (length 10.5–11.0 mm, bipectinate).

♂ genitalia (Figs. 20, 23). Just like the moths themselves, also their genitalia are always larger than in *L. katinka;* the ♂ genitalia of *L. katinka* have only about ¾ of the overall size of *L. diffundata,* expressed in all dimensions: length of uncus, saccus and phallus, basal width of saccus, length and width of valves, etc. This difference in size is one of the main and most important differences between the species; the differences in morphology (shapes and size relations between parts) are to some degree variable, and not every single specimen exhibits all of them clearly (for example, the HT of *L. katinka diversiocellata* does not clearly express all characters of *L. katinka,* but, in contrast, in some rather resembles *L. diffundata,* see Fig. 21). So a safe determination always requires either a direct comparison of ♂ genitalia of both species or exact measurements of the sizes and good scales in the illustrations. In the size and in some of the morphological characters of the ♂ genitalia, *L. diffundata* resembles the parapatric southern (Sundanian) species *L. megacore* (northern Sundaland) and *L. cynopis* (Java, Bali), and these 3 species (and some more of the SE Asian insular *Loepa* species) appear to form a small, possibly monophyletic species-group of large species.

Uncus of the new species bifid for the most distal part of its length, on average over a slightly shorter proportion than in *L. katinka*. Valves in the typical form of the genus, with the sacculus prolonged into a long finger-like pollex, above which there is a large, more or less U-shaped indentation before the distoapical part of the valves (the costal part) begins. (In contrast to *L. sikkima,* where this indentation is reduced in width by a slightly sclerotised prolongation of the saccus above the much shorter finger-like pollex which reduces the opening between pollex and apical lobe to a nearly ¾-closed circle, and in contrast to *L. katinka,* where the pollex is shorter.) The costal lobe of the valves in *L. diffundata* is soft, often covered with some hairs, and shows a shape which is tapering slowly to the round tip (in contrast to Himalayan *L. katinka,* where the apical costal lobe usually is rounded in a more quadrangular shape); this shape of the costal lobe of *L. diffundata* somehow recalls similar shapes in *L. megacore* and *L. cynopis* and a few other southern insular species. Saccus long and basally often relatively broad, juxta with 2 short lateral sclerotisations.

Phallus of *L. diffundata* long (ca. 7–8 mm long) and broader, always longer than in e.g. *L. katinka* or *L. sikkima* (ca. 4–5.5 mm long and narrower in *L. katinka,* maybe even slightly smaller in *L. sikkima*). The cornuti are quite variable in the species, but in *L. diffundata* the vesica shows on the dorsal side slightly to the right only 1 basally weakly sclerotised, but usually broad cornutus, laterally on the right and left side of the distal end of the sclerotised tube of the phallus a variable small field of little sclerites. In *L. katinka:* usually 2 variable, usually small sclerotised areas (not always real cornuti, sometimes just humps) to the right and left side (often just patchy or short partial ring-like on the vesica). The shape of the distal end of the sclerotised tube of the phallus is also somehow different between the species, but very variable.

Preimaginal instars (Figs. 11–16). The new species was reared several times, unfortunately not from Laos so far, but, e.g., by the senior author from Northern Thailand and Bhutan. Eggs are of chestnut brown colour and have a regular ovoid shape. The larvae show the typical *Loepa* pattern with dead leaf mimesis from 3rd instar on (see Nässig & Treadaway 1988: 171–172, Nässig et al. 1996b). Foodplants used in captivity were members of Vitaceae, as generally known for the genus; leaves of *Parthenocissus* sp. were easily accepted. We figure all 5 instars of the larvae from Bhutan reared in 2007, and a fullgrown L_5 larva from Doi Pha Hom Pok, northern Thailand, reared in late 2006.

© Entomologischer Verein Apollo e. V., Frankfurt am Main

Discussion

Confusion about the identity of *L. katinka* on one side and other species (including *L. diffundata*) on the other side in literature started already with the original description of the genus in which Horsfield & Moore (1860 ["1858–1859"]) included Javanese specimens, although *L. katinka* was described from Himalayan regions only. At that time all authors evidently regarded all *Loepa* specimens to belong to a single, variable species; genitalia were not checked then. The same happened in the valid generic description by Moore (1859), which was even based on taxa of different genera (see Nässig 2007: 176). As we know today, *L. katinka* is a typical Himalayan faunal element which occurs only at medium to high altitudes; it easily can be separated from the only similar sympatric Himalayan species, *L. sikkima,* by the smaller ocelli, more intensive markings (in wild collected specimens), differences in genitalia, especially the different valve structure of the ♂♂ (see above), and by its behaviour: ♂♂ showed a flight activity at artificial lights from around 19.30 to 22.30 h, while those of *L. sikkima* arrived at lights in early morning hours; and *L. sikkima* in general is a representative of lower altitudes.

L. diffundata was correctly identified as a species different from *L. katinka* by Pinratana & Lampe (1990), but the authors unfortunately used the wrong name for it. Several authors followed that misidentification (e.g., Allen 1993: 61, Nässig 1994b: 349, Naumann 1995: 82, Nässig et al. 1996a: 68, 1996b: 137 *ff*., d'Abrera 1998: 48, 49, Nässig & Treadaway 1998: 395, Brosch et al. 1999: 46, Smith 2001: 40). *L. diffundata* easily can be separated from *L. katinka* by its larger size, smaller ocelli, more reduced dark ornamentation, and larger ♂ genitalia. It generally flies at lower altitudes than *L. katinka*, and ♂♂ were found to have an activity peak in the wild at light from around 1:30–4:00 h in the morning (at least when these data were reported at all); however, specimens of *L. katinka* and *L. diffundata* may sometimes be collected at the same place in the same night at light (see material lists). Differences to *L. katinka* were already well described by Pinratana & Lampe (1990). *L. diffundata* externally resembles (caused by its larger size and less colourful wing markings) much more the big Sundanian species *L. megacore* or especially *L. cynopis* and other insular taxa rather than *L. katinka*. In contrast, *L. sumatrana* from the mountains of Sumatra externally appears to be much more a "nearly identical twin" of *L. katinka,* although its genitalia are distinct.

3) On *Antheraea (Antheraeopsis) mezops*

Interest turned to *A. mezops* Bryk more than a decade ago when lots of material from Mt. Fan Si Pan of Northern Vietnam came into the hands of German entomologists. Because most of the types of taxa associated with the subgenus *Antheraeopsis* Wood-Mason, 1886 were unkown to those dealing with the material at that time, Vietnamese specimens were first believed to represent an unnamed taxon (Paukstadt & Paukstadt 1998: 7, cited again with the same status in U. Paukstadt et al. 1998: 319). Later, however, when photos of Bryk's type specimens became available, they were referred to *A. mezops* (U. Paukstadt et al. 1999: 451), and the taxon *mezops* was raised to species rank due to genitalia differences to other species.

During the last about 20 years several *Antheraea* taxa were combined and synonymized in different ways, obviously always without proper studies of type specimens before. Holloway (1987: 101) synonymized several taxa including *A. assamensis mezops* with *A. assamensis.* Similar was the handling of another taxon, *A. castanea* Jordan, 1910: Although known that it was described from N.E. India, populations of the subgenus *Antheraeopsis* mentioned as *A. assamensis* by Pinratana & Lampe (1990) for Thailand (following Holloway) as well as those from Sundaland were referred to *A. castanea* by Nässig et al. (1996a & b), for the Sundanian part as subspecies *youngi* Watson, 1915. Also for the Laotian fauna specimens were tentatively listed under *A. castanea* by Brosch et al. (1999: 44), always noting that the type material was not checked and a final determination would follow in a then planned revision; in fact, today we would prefer to place them with *A. assamensis* or a near relative. *Antheraea (Antheraeopsis) youngi* Watson, 1915 was interpreted as a separate Sundanian species already by Nässig & Treadaway (1998: 288), U. Paukstadt et al. (2000: 23) as well as most recently by Beck & Nässig (2008). As already mentioned by Paukstadt & Paukstadt (2008: 160 *ff*.), both *A. castanea* and *A. mezops* are representatives which occur at higher altitudes only; in Kachin State specimens were collected at altitudes from 1640–2800 m (Figs. 18a, 18b, 19).

With the kind help of V. Zolotuhin, photos of a ♂ ST of *A. castanea* deposited in BMNH (Figs. 17a, 17b) including its genitalia (Fig. 24) could be studied. It completely agrees in all details with the known type specimens of *A. mezops* in NRMS, with recently collected material from N.E. Myanmar in the senior author's collection, with specimens from Yunnan, P.R. China, and from northern Vietnam. Typical features of the ♂ are the prolongated fw. apex which is bent backward a little at its acute tip, and the ♂ genitalia structures which show almost no differences in material from India, Myanmar, and Vietnam, and both in ♂ and ♀ specimens the typical colouration of the ventral wing side with lots of white scales combined with dark, partly almost black areas. The note by Paukstadt & Paukstadt (2008: 159) that there occur differences in ♂ genitalia structures in both species cannot be confirmed when referring to type material of both taxa involved; both ♂ genitalia are almost identical, with some variation in the form of the dorsal process of the valves which is within the specific variability, judging from longer dissection series of the species from different localities.

As a result, *Antheraea (Antheraeopsis) mezops* Bryk, 1944 is here understood as a new junior subjective synonym of

© Entomologischer Verein Apollo e. V., Frankfurt am Main

Antheraea (Antheraeopsis) castanea Jordan, 1910 **syn. n.,** and the ♂ **lectotype** of the latter with data: *Antheraea castanea* Jord., Nov. Zool, 1910; Khasia Hills, Assam; Rothschild Bequest B.M.1939-1; Type [typical red-ringed BMNH label], **is herewith designated** (Figs. 17a, 17b) from a ST series of 4 ♂♂ and 3 ♀♀ to fix the identity of the taxon to stabilize nomenclature in accordance with the ICZN (1999).

Acknowledgements

We would like to acknowledge the following colleagues who helped in various ways, with supplying material, giving access to and information from their museum or private collections, field work and literature, and sharing information: Yatuka Arita, Htay Aung, Martin Beeke, Ulrich Brosch, Adam Cotton, Yasuyuki Fukinuki, Dr. Bert Gustafsson, Armin Hauenstein, Thomas Ihle, Dr. Axel Kallies, Peter Kautt, Yasunori Kishida, Dr. Ian J. Kitching, Teemu Klemetti, Dr. Darren Mann, Dr. Geoff Martin, Dr. Wolfram Mey, Dr. Matthias Nuss, Laela Hayati & Ulrich Paukstadt, Dr. Richard S. Peigler, Brother Amnuay Pinratana, Arthit Rukhasikorn, Dr. Alexander Schintlmeister, Hermann Schnitzler, Yasuyuki Watanabe, Ulrich Weritz, "Victor" Yun Wu, and Dr. Vadim Zolutuhin.

References

Allen, M. G. (1993): Marvellous moths of Nepal. [The Sphingidae (hawk moths), Saturniidae (atlas, lunar and emperor moths) and Brahmaeidae]. — Know Nepal Series, Kathmandu, **6:** 1–72.

Arora, G. S., & Gupta, I. J. (1979) Taxonomic studies on some of the Indian non-mulberry silkmoths (Lepidoptera: Saturniidae: Saturniinae). — Memoirs of the Zoological Survey of India, Calcutta, **16** (1): i–ii, 1–63, pls. I–XI.

Beck, J., & Nässig, W. A. (2008): Diversity and abundance patterns, and revised checklist, of saturniid moths from Borneo (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **28** (3/4): 155–164.

Brechling, R. (1997): Zwei neue Saturniiden aus dem Gebirgsmassiv des Fan Si Pan (nördliches Vietnam): *Salassa fansipana* sp. n. und *Loepa roseomarginata* sp. n. (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **18** (1): 75–87.

—— (2007): Fünf neue Taxa der Gattung *Actias* Leach, 1815 aus China (Lepidoptera: Saturniidae). — Entomofauna. Zeitschrift für Entomologie, Ansfelden, **Monographie 1:** 12–27.

Brosch, U., Naumann, S., Paukstadt, L. H., Paukstadt, U., Tcherniak, I., & Beeke, M. (1999): Anmerkungen zur Brahmaeiden- und Saturniidenfauna von Laos und Kambodscha (Lepidoptera: Bombycoidea). — Galathea, Berichte des Kreises Nürnberger Entomologen e.V., Nürnberg, **Suppl. 6:** 33–58, col.-pls. IV–V.

Bryk, F. (1944): Entomological results from the Swedish expedition 1934 to Burma and British India. Lepidoptera: Saturniidae, Bombycidae, Eupterotidae, Uraniidae, Epiplemiidae und Sphingidae. Gesammelt von René Malaise. — Arkiv för Zoologi, Stockholm, **35A** (8): 1–55, pls. I–VI.

Cotes, E. C., & C. Swinhoe (1887): A catalogue of the moths of India. Part II, Bombyces. — Calcutta (Trustees of the Indian Museum), 812 pp.

D'Abrera, B. (1998): Saturniidae mundi. Saturniid moths of the world. Part **III.** — Keltern (Goecke & Evers), 171 pp., 87 col.-pls.

Fletcher, D. S., & Nye, I. W. B. (1982): Bombycoidea, Castnioidea, Cossoidea, Mimallonoidea, Sesioidea, Sphingoidea, Zygaenoidea. — *In:* Nye, I. W. B. (ed.), The generic names of moths of the world, vol. **4.** — London (Trustees of the British Museum (Natural History)), xiv + 192 pp.

Haruta, T. (1992): Saturniidae. — Pp. 93–94, col.-pls. 25–26 *in:* Haruta, T. (ed.), Moths of Nepal, Part 1. — Tinea, Tokyo, **13 (Suppl. 2),** xvii + 123 pp., col.-pls. 1–32.

—— (1994): Saturniidae. — P. 159, col.-pl. 93 *in:* Haruta, T. (ed.), Moths of Nepal, Part 3. — Tinea, Tokyo, **14 (Suppl. 1),** xvii + 171 pp., col.-pls. 65–96.

Holloway, J. D. (1987): The moths of Borneo, part **3,** [internal title: Superfamily Bombycoidea], Lasiocampidae, Eupterotidae, Bombycidae, Brahmaeidae, Saturniidae, Sphingidae. — Kuala Lumpur (Southdene Sdn. Bhd.), 200 pp. + 18 b&w pls. + 20 col.-pls.

Horsfield, T. & Moore, F. (1860 ["1858–1859"]): A catalogue of the lepidopterous insects in the Museum of Natural History at the East-India House, vol. **2.** — London (Wm. H. Allen): [279]–440 + 9 pp. without pagination, 18 col.-pls.

ICZN [International Commission on Zoological Nomenclature] (1999): International Code of Zoological Nomenclature, fourth edition, adopted by the International Union of Biological Sciences. — London (International Trust for Zoological Nomenclature, BMNH), xxix + 306 pp.

Jordan, K. (1910): New Saturniidae. — Novitates Zoologicae. A Journal of Zoology, Tring, **17** (3): 470–476.

Kirby, W. F. (1892): A synonymic catalogue of Lepidoptera Heterocera (moths). Vol. **I.** Sphinges and Bombyces. — London (Gurney & Jackson), xii + 951 pp.

Moore, F. (1859): Synopsis of the known Asiatic species of silk-producing moths, with descriptions of some new species from India. — Proceedings of the Scientific Meetings of the Zoological Society of London, London, **27:** 237–270, Annulosa pls. LXIV–LXV.

—— (1865): On the lepidopterous insects of Bengal. Fam. Saturniidae. — Proceedings of the Scientific Meetings of the Zoological Society of London, London, **1865:** 755–823.

Nässig, W. A. (1989a): Systematisches Verzeichnis der Gattung *Cricula* Walker, 1855 (Lepidoptera, Saturniidae). — Entomologische Zeitschrift, Essen, **99** (13): 181–192, (14): 193–198.

—— (1989b): Systematisches Verzeichnis der Gattung *Solus* Watson 1913 (Lepidoptera, Saturniidae). — Entomologische Zeitschrift, Essen, **99** (23): 337–345.

—— (1994a): Vorschlag für ein neues Konzept der Gattung *Saturnia* Schrank, 1802 (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **15** (3): 253–266.

—— (1994b): Vorläufige Anmerkungen zur Saturniiden- und Brahmaeidenfauna von Vietnam mit Neubeschreibungen (Lepidoptera). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **15** (3): 339–358.

—— (2007): Assessment of the proper nomenclature of *Loepa* Moore, 1859 and its type species (Saturniidae). — Nota lepidopterologica, Dresden, **30** (1): 175–178.

——, Lampe, R. E. J., & Kager, S. (1989): A new species of *Loepa* from Sumatra (Lepidoptera, Saturniidae). — Heterocera Sumatrana, Göttingen, **2** (7): 145–152.

——, ——, & —— (1996a): The Saturniidae of Sumatra (Lepidoptera). — Heterocera Sumatrana, Göttingen, **10:** 3–110.

© Entomologischer Verein Apollo e. V., Frankfurt am Main

——, ——, & —— (1996b): The Saturniidae of Sumatra, Appendix I: The preimaginal instars of some Sumatran and South East Asian species of Saturniidae, including general notes on the genus *Antheraea* (Lepidoptera). — Heterocera Sumatrana, Göttingen, **10:** 111–170.

——, & Oberprieler, R. G. (1994): Notes on the systematic position of *Sinobirma malaisei* (Bryk 1944) and the genera *Tagoropsis, Maltagorea,* and *Pseudantheraea* (Lepidoptera, Saturniidae: Saturniinae, Pseudapheliini). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **15** (3): 369–382.

——, & Ragus, G. (2001): Annotations on selected *Loepa* species and their preimginal instars. 1. The larval morphology of *Loepa miranda* Atkinson *in* Moore, 1865 (Lepidoptera: Saturniidae, Saturniinae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **21** (4): 247–251. — Corrigendum: Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **22** (1): 36.

——, & Suhardjono, Y. R. (1989): A new species of the genus *Loepa* (Saturniidae) from Java. — Tinea, Tokyo, **12** (23): 205–210.

——, & Treadaway, C. G. (1988): Bemerkungen über die *Loepa*-Arten der Philippinen (Lepidoptera, Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **9** (3): 159–176.

——, & —— (1998): The Saturniidae (Lepidoptera) of the Philippines. — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, **Suppl. 17:** 223–424.

Naumann, S. (1995): Die Saturniiden-Fauna von Sulawesi, Indonesien. — Doctoral thesis, Freie Universität Berlin, 145 pp.

—— (1998): *Loepa obscuromarginata* n. sp., eine neue Saturniide aus der Volksrepublik China (Lepidoptera: Saturniidae). — Entomologische Zeitschrift, Essen, **108** (2): 49–56.

—— (2006): Notes on *Actias dubernardi* (Oberthür, 1897), with description of the early instars (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **27** (1/2): 9–16.

——, & Löffler, S. (2005): Notes on the genus *Saturnia* Schrank, 1802, with description of a new species (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **26** (4): 169–176.

——, & Peigler, R. S. (2001): Four new species of the silkmoth genus *Samia* (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **22** (2): 75-83.

Oberprieler, R. G. (1997): Classification of the African Saturniidae (Lepidoptera) — the quest for natural groups and relationships. — Metamorphosis, Journal of the Lepidopterists' Society of Africa, Occasional Supplement **3:** 142–155.

Paukstadt, U., Brosch, U., & Paukstadt, L. H. (1999): Taxonomische Anmerkungen zu *Antheraea (Antheraeopsis) mezops* Bryk 1944, (stat. rev.) von Myanmar und Vietnam, sowie die Beschreibung des unbekannten Weibchens (Lepidoptera: Saturniidae). — Entomologische Zeitschrift, Stuttgart, **109** (11): 450–457.

——, ——, & —— (2000): Preliminary checklist of the names of the worldwide genus *Antheraea* Hübner, 1819 ("1816") (Lepidoptera: Saturniidae). — Galathea, Berichte des Kreises Nürnberger Entomologen e.V., Nürnberg, **Suppl. 9:** 1–59.

——, & Paukstadt, L. H. (1998): Die wilden Seidenspinner der östlichen Kleinen Sundainseln, Indonesien — eine Übersicht der bisherigen Ergebnisse unserer entomologischen Reisen (Lepidoptera: Saturniidae). — Galathea, Berichte des Kreises Nürnberger Entomologen e.V., Nürnberg, **Suppl. 4:** 1–34.

——, & —— (2008): A preliminary annotated checklist of the Indonesian wild silkmoths — Part VI. The subgenus *Antheraeopsis* Wood-Mason, 1886 of the genus *Antheraea* Hübner, 1819 ("1816") (Lepidoptera: Saturniidae: Saturniinae). — Beiträge zur Kenntnis der wilden Seidenspinner, Wilhelmshaven, **6** (3): 131–196.

——, —— & Brosch, U. (1998): Taxonomische Änderungen und Anmerkungen zu den Taxa der Gattung *Antheraea* Hübner [1819] von Sumatera [sic], Indonesien (Lepidoptera: Saturniidae). — Entomologische Zeitschrift, Stuttgart, **108** (8): 317–324.

Peigler, R. S., & Naumann, S. (2003): A revision of the silkmoth genus *Samia*. — San Antonio (University of the Incarnate Word), 227 [+ 4] pp., 10 maps, 16 col.-pls & 4 b&w pls. with legends.

Pinratana, A., & Lampe, R. E. J. (1990): Moths of Thailand, vol. one, Saturniidae. — Bangkok (Brothers of St. Gabriel in Thailand), v + 47 pp., 44 col.-pls.

Racheli, L. (2008): Noteworthy records of saturniids from northern Myanmar with notes on the true identity of *Loepa diversiocellata* (Lepidoptera, Saturniidae). — Fragmenta entomologica, Rome, **40** (1): 157–166.

Roepke, W. [K. J.] (1918): Over het opkweeken van eenige merkwaardige vlindersoorten uit eieren. II. *Loepa katinka* Westw. — De Tropische Natuur, Weltevreden, **7** (12): 184–188.

—— (1953): The *katinka* group of the genus *Loepa* (Lepidoptera Heterocera, Saturniidae). — Tijdschrift voor Entomologie, Leiden, Harlem, **96** (3): 227–230, pl. 6.

Smith, C. (2001): Lepidoptera of Nepal. Checklist (butterflies & moths). — Kavre, Nepal (Abacus Educational Kathmandu University High School), 110 pp.

Swinhoe, C. (1892): Catalogue of the eastern and Australian Lepidoptera Heterocera in the collection of the Oxford University Museum. Part **1,** Sphinges and Bombyces. — Oxford (Clarendon), viii + 324 pp., 8 pls.

—— (1894): A list of the Lepidoptera of the Khasia Hills. Pt. II. — Transactions of the Entomological Society of London, London, **1894:** 145–223, col.-pl. II.

Westwood, J. O. (1847–1848): The cabinet of oriental entomology; being a selection of some of the rarer and more beautiful species of insects, natives of India and the adjacent islands, the greater portion of which are now for the first time described and figured. — London (William Smith), 2 + 88 pp., 42 col.-pls.

Witt, T. J., & Pugaev, S. N. (2007): *Salassa belinda* sp. n. — A new Nepalese Saturniidae species from the *lola* Westwood, 1847-group (Lepidopotera, Saturniidae). — Entomofauna. Zeitschrift für Entomologie, **Monographie 1:** 1–11.

Yen, S.-H., Näßig, W. A., Naumann, S., & Brechlin, R. (2000): A new species of the *miranda*-group of the genus *Loepa* from Taiwan (Lepidoptera, Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **21** (3): 153–162.

Yun, W., & Naumann, S. (2006): The preimaginal instars of *Actias chapae* (Mell, 1950) (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **27** (1/2): 17–21.

© Entomologischer Verein Apollo e. V., Frankfurt am Main, Dezember 2008 ISSN 0723-9912

© Entomologischer Verein Apollo e. V., Frankfurt am Main